CLAIMS

1. (Amended) A general drive control system provided in a vehicle including a plurality of actuators and an energy source common to the actuators, accomplishing a work by an operation of said plurality of actuators consuming energy supplied by said energy source, comprising a control apparatus generally controlling drive of said plurality of actuators, with amount of drive of each of the plurality of actuators being determined in a dimension of work or power as work per unit time.

2. (Amended) The general drive control system according to claim 1, wherein a target value of each actuator is represented and determined in a dimension of power or work from a drive request, and said control apparatus generally controls drive of said plurality of actuators based on a target power or target work as the determined target value.

3. (Amended) The general drive control system according to claim 1, wherein a drive request and each actuator are related to each other in a dimension of power or work, and said control apparatus generally controls drive of said plurality of actuators based on the power or work.

4. (Amended) The general drive control system according to any of claims 1 to 3, wherein said work is classified into at least one of force, heat, sound and light.

5. (Amended) The general drive control system according to any of claims 1 to 3, wherein said plurality of actuators are of mutually different type.

6. (Amended) The general drive control system according to any of claims 1 to 5, wherein

said control apparatus generally controls drive of said plurality of actuators based on a total power or a total work that is a sum of power or

work approximately at the same time period, of said plurality of actuators.

7. (Amended) The general drive control system according to any of claims 1 to 6, wherein

said control apparatus generally controls drive of said plurality of actuators such that said power or work of each of said actuators or said total power or total work of said plurality of actuators does not exceed an allowable value.

8. (Amended) The general drive control system according to claim 7, wherein

said control apparatus includes a power limiting unit limiting, when said total power or total work is about to exceed said allowable value, power of at least a part of said plurality of actuators in accordance with an order set in advance for said plurality of actuators.

9. (Amended) The general drive control systems according to any of claims 1 to 8, further comprising

a driving request determining apparatus determining a driving request for said vehicle; wherein

said control apparatus determines said power or said work based on the determined driving request as a desired power or desired work, and generally controls drive of said plurality of actuators based on the determined desired power or desired work.

10. (Amended) The general drive control system according to claim 9, wherein

said driving request determining apparatus includes

a driving information detector detecting at least one of a driver's instruction driving said vehicle, state of operation of said vehicle, and operation environment in which said vehicle is placed, as driving information, and

a driving request determining unit determining said driving request

based on the detected driving information; and

said control apparatus generally controls drive of said plurality of actuators based on said power or work based on the determined driving request.

11. (Amended) The general drive control system according to claims 9 or 10, wherein

said control apparatus determines, based on said determined driving request, said power or work to meet the driving request as a desired power or desired work for each of said actuators, and based on the determined desired power or desired work, generally controls drive of said plurality of actuators.

12. (Amended) The general drive control system according to any of claims 9 to 11, wherein

said control apparatus includes

a desired power determining unit determining, for each of said actuators, power to meet said determined driving request as a desired power;

a required electric power determining unit determining required electric power to be supplied to each actuator to realize the desired power determined for each of said actuators;

a desired power establishing unit establishing, when a total required electric power as a sum of required electric power determined for the plurality of actuators exceeds said allowable value, desired power for each of the plurality of actuators by decreasing corresponding desired power of some of said plurality of actuators; and

a driving unit driving said plurality of actuators based on the established desired power.

13. (Amended) The general drive control system according to claim 12, wherein

said desired power establishing unit decreases desired power

determined for some of said actuators, in accordance with an order set in advance for said plurality of actuators, when said total required electric power exceeds said allowable value.

14. (Amended) The general drive control system according to any of claims 9 to 11, wherein

said control apparatus includes

a desired power determining unit determining, for each of said actuators, power to meet said determined driving request as desired power;

a desired work determining unit determining, for each of said actuators, desired work based on said determined desired power;

a total work determining unit determining, as a total work, a sum of the plurality of desired works determined for respective ones of said plurality of actuators;

a desired power establishing unit establishing desired power for each of said plurality of actuators by decreasing, for some of said plurality of actuators, corresponding desired power, when the determined total work exceeds said allowable value; and

a driving unit driving said plurality of actuators based on the established desired power.

15. (Amended) The general drive control system according to claim 14, wherein

said desired power establishing unit decreases the desired power determined for some of said actuators, in accordance with an order set in advance for said plurality of actuators, when said total work exceeds said allowable value.

16. (Amended) The general drive control system according to claim 14 or 15, wherein

said driving unit determines, for each of said actuators, electric power to be supplied to each actuator as supplied electric power, based on said established desired power, and drives each of said actuators with the

~~determined supplied electric power.~~

17. (Amended) The general drive control system according to any of claims 7 to 16, wherein

said control apparatus includes a control mode changing unit manually or automatically changing said allowable value, thereby changing control mode for controlling said plurality of actuators.

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18. (Amended) The general drive control system according to claim 17, wherein

said control mode changing unit selects as said control mode an economy mode in which saving of energy consumed by said plurality of actuators is given higher priority than realization of a target state of operation of said vehicle, by setting said allowable value to a small value, in a normal state of operation of said vehicle, and selects as said control mode a power-mode in which realization of the target state of operation of said vehicle is given higher priority than said saving of energy consumption, by setting said allowable value to a large value, in an emergency state of operation of said vehicle, and

said control apparatus generally controls drive of said plurality of actuators in accordance with the selected control mode.

19. (Amended) The general drive control system according to any of claims 1 to 18, wherein

said plurality of actuators constitute a consumption unit consuming energy supplied from said energy source;

said energy source includes

a generating unit generating said energy, and

a storage unit storing the generated energy; and

said control apparatus includes

an apparent value determining unit determining an apparent value of said power or said work based on actual power or actual work of each of said actuators, energy generation ratio or energy generation amount by

said generating unit, and energy storage ratio or storage amount by said storage unit, and

a control unit generally controlling drive of said plurality of actuators, based on the determined apparent value.

20. (Amended) The general drive control system according to any of claims 1 to 19, wherein

~~said control apparatus includes a master control unit~~ provided common to said plurality of actuators and generally managing the plurality of actuators, and the master control unit generally controls drive of said plurality of actuators based on said power or said work.

21. (Amended) The general drive control system according to claim 20, wherein

said master control unit enables realization of the target state of operation of said vehicle by said plurality of actuators and saving of energy consumed by the plurality of actuators.

22. (Amended) The general drive control system according to claim 20 or 21, wherein

said control apparatus includes a plurality of individual control units connected to said master control unit and individually controlling each of said actuators, and each individual control unit communicates with said master control unit.

23. (Amended) The general drive control system according to any of claims 20 to 22, further comprising

an energy detector provided for each of said actuators, for detecting at least one of input energy input to each actuator and an output energy output from each actuator, connected to said master control unit and to the individual control unit corresponding to each actuator.

24. (Amended) The general drive control system according to any of

claims 1 to 23, wherein

said vehicle itself moves by the operation of at least part of said plurality of actuators.

25. (Amended) The general drive control system according to any of claims 1 to 24, wherein

said actuators are at least two selected from an engine, a driving apparatus, a steering, a brake, an air conditioner and a light.

26. (Amended) The general drive control system according to any of claims 1 to 25, wherein

said control apparatus generally controls drive of said plurality of actuators by distributing among the plurality of actuators, available power or available work, which is the power or work that can be supplied by said energy source to the plurality of actuators as a whole, based on a safety variable related to safety of said vehicle, a comfort variable related to comfort enjoyed by the human being using said vehicle, and an economy variable related to economy of energy consumption by said plurality of actuators.

27. (Amended) A general drive control system provided in a vehicle including a plurality of actuators and an energy source common to the actuators, accomplishing a work by an operation of said plurality of actuators consuming energy supplied by said energy source, comprising

control means for generally controlling drive of said plurality of actuators, with amount of drive of each of the plurality of actuators being determined in a dimension of work or power as work per unit time.

28. (Amended) The general drive control system according to claim 27, wherein a target value of each actuator is represented and determined in a dimension of power or work from a drive request, and said control means includes means for generally controlling drive of said plurality of actuators based on a target power or target work as the determined target

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value.

29. (Amended) The general drive control system according to claim 27, wherein a drive request and each actuator are related to each other in a dimension of power or work, and said control apparatus includes means for generally controlling drive of said plurality of actuators based on the power or work.

30. (Amended) The general drive control system according to any of claims 27 to 29, wherein
said work is classified into at least one of force, heat, sound and light.

31. (Amended) The general drive control system according to any of claims 27 to 29, wherein
said plurality of actuators are of mutually different type.

32. (Amended) The general drive control system according to any of claims 27 to 31, wherein
said control means includes means for generally controlling drive of said plurality of actuators based on a total power or a total work that is a sum of power or work approximately at the same time period, of said plurality of actuators.

33. (Amended) The general drive control system according to any of claims 27 to 32, wherein
said control means includes means for generally controlling drive of said plurality of actuators such that said power or work of each of said actuators or said total power or total work of said plurality of actuators does not exceed an allowable value.

34. (Amended) The general drive control system according to claim 33, wherein
said control means includes

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power limiting means for limiting, when said total power or total work is about to exceed said allowable value, power of at least a part of said plurality of actuators in accordance with an order set in advance for said plurality of actuators.

35. (Amended) The general drive control system according to any of claims 27 to 34, further comprising

~~driving request determining means for determining~~ a driving request for said vehicle; wherein

said control means includes means for determining said power or said work based on the determined driving request as a desired power or desired work, and for generally controlling drive of said plurality of actuators based on the determined desired power or desired work.

36. (Amended) The general drive control system according to claim 35, wherein

said driving request determining means includes

driving information detecting means for detecting at least one of a driver's instruction driving said vehicle, state of operation of said vehicle, and operation environment in which said vehicle is placed, as driving information, and

driving request determining means for determining said driving request based on the detected driving information; and

said control means includes means for generally controlling drive of said plurality of actuators based on said power or work based on the determined driving request.

37. (Amended) The general drive control system according to claim 35 or 36, wherein

said control apparatus includes means for determining, based on said determined driving request, said power or work to meet the driving request as a desired power or desired work for each of said actuators, and based on the determined desired power or desired work, for generally

-controlling drive of said plurality of actuators.

38. (Amended) The general drive control system according to any of claims 35 to 37, wherein

said control means includes

desired power determining means for determining, for each of said actuators, power to meet said determined driving request as a desired power;

required electric power determining means for determining required electric power to be supplied to each actuator to realize the desired power determined for each of said actuators;

desired power establishing means for establishing, when a total required electric power as a sum of required electric powers determined for the plurality of actuators exceeds said allowable value, desired power for each of the plurality of actuators by decreasing corresponding desired power of some of said plurality of actuators; and

driving means for driving said plurality of actuators based on the established desired power.

39. (Amended) The general drive control system according to claim 38, wherein

said desired power establishing means includes means for decreasing desired power determined for some of said actuators, in accordance with an order set in advance for said plurality of actuators, when said total required electric power exceeds said allowable value.

40. (Amended) The general drive control system according to any of claims 35 to 37, wherein

said control means includes

desired power determining means for determining, for each of said actuators, power to meet said determined driving request as desired power;

desired work determining means for determining, for each of said actuators, desired work based on said determined desired power;

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~~total work determining means for determining,~~ as a total work, a sum of the plurality of desired works determined for respective ones of said plurality of actuators;

desired power establishing means for establishing desired power for each of said plurality of actuators by decreasing, for some of said plurality of actuators, corresponding desired power, when the determined total work exceeds said allowable value; and

~~driving means for driving said plurality of actuators based on the~~ established desired power.

41. (Amended) The general drive control system according to claim 40, wherein

said desired power establishing means includes means for decreasing the desired power determined for some of said actuators, in accordance with an order set in advance for said plurality of actuators, when said total work exceeds said allowable value.

42. (Amended) The general drive control system according to claim 40 or 41, wherein

said driving means includes means for determining, for each of said actuators, electric power to be supplied to each actuator as supplied electric power, based on said established desired power, and for driving each of said actuators with the determined supplied electric power.

43. (Amended) The general drive control system according to any of claims 33 to 42, wherein

said control means includes control mode changing means for manually or automatically changing said allowable value, thereby changing control mode for controlling said plurality of actuators.

44. (Amended) The general drive control system according to claim 43, wherein

said control mode changing means includes means for selecting as

said control mode an economy mode in which saving of energy consumed by said plurality of actuators is given higher priority than realization of a target state of operation of said vehicle, by setting said allowable value to a small value, in a normal state of operation of said vehicle, and for selecting as said control mode a power mode in which realization of the target state of operation of said vehicle is given higher priority than said saving of energy consumption, by setting said allowable value to a large value, in an emergency state of operation of said vehicle, and

said control means includes means for generally controlling drive of said plurality of actuators in accordance with the selected control mode.

45. (Amended) The general drive control system according to any of claims 27 to 44, wherein

said plurality of actuators constitute a consumption unit consuming energy supplied from said energy source;

said energy source includes

a generating unit generating said energy, and

a storage unit storing the generated energy; and

said control means includes

apparent value determining means for determining an apparent value of said power or said work based on actual power or actual work of each of said actuators, energy generation ratio or energy generation amount by said generating unit, and energy storage ratio or storage amount by said storage unit, and

control means for generally controlling drive of said plurality of actuators.

46. (Amended) The general drive control system according to any of claims 27 to 45, wherein

said control means includes a master control unit provided common to said plurality of actuators and generally managing the plurality of actuators, and the master control unit generally controls drive of said plurality of actuators based on said power or said work.

47. (Amended) The general drive control system according to claim 46, wherein

said master control unit enables realization of the target state of operation of said vehicle by said plurality of actuators and saving of energy consumed by the plurality of actuators.

~~48. (Amended) The general drive control system according to claim~~ 46 or 47, wherein

said control means includes a plurality of individual control units connected to said master control unit and individually controlling each of said actuators, and each individual control unit communicates with said master control unit.

49. (Amended) The general drive control system according to any of claims 46 to 48, further comprising

energy detecting means provided for each of said actuators, for detecting at least one of input energy input to each actuator and an output energy output from each actuator, connected to said master control unit and to the individual control unit corresponding to each actuator.

50. (Amended) The general drive control system according to any of claims 27 to 49 wherein

said vehicle itself moves by the operation of at least part of said plurality of actuators.

51. (Amended) The general drive control system according to any of claims 27 to 50, wherein

said actuators are at least two selected from an engine, a driving apparatus, a steering, a brake, an air conditioner and a light.

52. (Amended) The general drive control system according to any of claims 27 to 51, wherein

~~said control means includes means for generally controlling drive of~~ said plurality of actuators by distributing among the plurality of actuators, available power or available work, which is the power or work that can be supplied by said energy source to the plurality of actuators as a whole, ~~based on a safety variable related to safety of the vehicle, a comfort variable~~ related to comfort enjoyed by the human being using the vehicle, and an economy variable related to economy of energy consumption by said ~~plurality of actuators.~~

53. (Amended) A general drive control method, implemented in a vehicle including a plurality of actuators and an energy source common to the actuators, for accomplishing a work by an operation of said plurality of actuators consuming energy supplied by said energy source, comprising the step of

generally controlling drive of said plurality of actuators, with amount of drive of each of the plurality of actuators being determined in a dimension of work or power as work per unit time.

54. (Amended) The general drive control method according to claim 53, wherein a target value of each actuator is represented and determined in a dimension of power or work from a drive request, and said step of generally controlling drive of said plurality of actuators includes the step of generally controlling drive of said plurality of actuators based on a target power or target work as the determined target value.

55. (Amended) The general drive control method according to claim 53, wherein a drive request and each actuator are related to each other in a dimension of power or work, and said step of generally controlling drive of said plurality of actuators includes the step of generally controlling drive of said plurality of actuators based on the power or work.

56. (Amended) The general drive control method according to any of claims 53 to 55, wherein

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said work is classified into at least one of force, heat, sound and light.

57. (Amended) The general drive control method according to any of claims 53 to 55, wherein

said plurality of actuators are of mutually different type.

58. (Amended) The general drive control method according to any of claims 53 to 57, wherein

said step of generally controlling drive of said actuators includes the step of controlling drive of said plurality of actuators based on a total power or a total work that is a sum of power or work approximately at the same time period, of said plurality of actuators.

59. (Amended) The general drive control method according to any of claims 53 to 58, wherein

said step of generally controlling drive of said actuators includes the step of controlling drive of said plurality of actuators such that said power or work of each of said actuators or said total power or total work of said plurality of actuators does not exceed an allowable value.

60. (Amended) The general drive control method according to claim 59, wherein

said step of generally controlling drive of said actuators includes the step of limiting, when said total power or total work is about to exceed said allowable value, power of at least a part of said plurality of actuators in accordance with an order set in advance for said plurality of actuators.

61. (Amended) The general drive control method according to any of claims 53 to 60, further comprising the step of determining a driving request for said vehicle; wherein

said step of generally controlling drive of said actuators includes the step of determining said power or said work based on the determined driving request as a desired power or desired work, and controlling drive of

said plurality of actuators based on the determined desired power or desired work.

62. (Amended) The general drive control method according to claim 61, wherein

said driving request determining step includes the steps of

detecting at least one of a driver's instruction driving said vehicle, state of operation of said vehicle, and operation environment in which said vehicle is placed, as driving information, and

determining said driving request based on the detected driving information; and

said step of generally controlling drive of said actuators includes the step of controlling drive of said plurality of actuators based on said power or work based on the determined driving request.

63. (Amended) The general drive control method according to claim 61 or 62, wherein

said step of generally controlling drive of said actuators includes the step of determining, based on said determined driving request, said power or work to meet the driving request as a desired power or desired work for each of said actuators, and based on the determined desired power or desired work, controlling drive of said plurality of actuators.

64. (Amended) The general drive control method according to any of claims 61 to 63, wherein

said step of generally controlling drive of said actuators includes the steps of

determining, for each of said actuators, power to meet said determined driving request as a desired power;

determining required electric power to be supplied to each actuator to realize the desired power determined for each of said actuators, as required electric power;

establishing, when a total required electric power as a sum of

~~required electric power determined for the plurality of actuators exceeds~~ said allowable value, desired power for each of the plurality of actuators by decreasing corresponding desired power of some of said plurality of actuators; and

driving said plurality of actuators based on the established desired power.

65. (Amended) The general drive control method according to claim 64, wherein

said step of establishing desired power includes the step of decreasing desired power determined for some of said actuators, in accordance with an order set in advance for said plurality of actuators, when said total required electric power exceeds said allowable value.

66. (Amended) The general drive control method according to any of claims 61 to 63, wherein

said step of generally controlling drive of said actuators includes the steps of

determining, for each of said actuators, power to meet said determined driving request as desired power;

determining, for each of said actuators, desired work based on said determined desired power;

determining, as a total work, a sum of the plurality of desired works determined for respective ones of said plurality of actuators;

establishing desired power for each of said plurality of actuators by decreasing, for some of said plurality of actuators, corresponding desired power, when the determined total work exceeds said allowable value; and

driving said plurality of actuators based on the established desired power.

67. (Amended) The general drive control method according to claim 66, wherein

said step of establishing desired power includes the step of

decreasing the desired power determined for some of said actuators, in accordance with an order set in advance for said plurality of actuators, when said total work exceeds said allowable value.

68. (Amended) The general drive control method according to claim 66 or 67, wherein

said step of driving actuators includes the step of determining, for each of said actuators, electric power to be supplied to each actuator as supplied electric power, based on said established desired power, and driving each of said actuators with the determined supplied electric power.

69. (Amended) The general drive control method according to any of claims 59 to 68, wherein

said step of generally controlling drive of said actuators includes the step of manually or automatically changing said allowable value, thereby changing control mode for controlling said plurality of actuators.

70. (Amended) The general drive control method according to claim 69, wherein

said step of changing control mode includes the step of selecting, as said control mode an economy mode in which saving of energy consumed by said plurality of actuators is given higher priority than realization of a target state of operation of said vehicle, by setting said allowable value to a small value, in a normal state of operation of said vehicle, and selecting, as said control mode a power-mode in which realization of the target state of operation of said vehicle is given higher priority than said saving of energy consumption, by setting said allowable value to a large value, in an emergency state of operation of said vehicle, and

said step of generally controlling drive of said actuators includes the step of controlling drive of said plurality of actuators in accordance with the selected control mode.

71. (Amended) The general drive control method according to any of

claims 53 to 70, wherein

said plurality of actuators constitute a consumption unit consuming energy supplied from said energy source;

said energy source includes

a generating unit generating said energy, and

a storage unit storing the generated energy; and

said step of generally controlling drive of said actuators includes the step of

determining an apparent value of said power or said work based on actual power or actual work of each of said actuators, energy generation ratio or energy generation amount by said generating unit, and energy storage ratio or storage amount by said storage unit, and

controlling drive of said plurality of actuators based on the determined apparent value.

72. (Amended) The general drive control method according to any of claims 53 to 71, wherein

said step of generally controlling drive of said actuators is executed by a master control unit provided common to said plurality of actuators and generally managing the plurality of actuators, and the master control unit controls drive of said plurality of actuators based on said power or said work.

73. (Added) The general drive control method according to claim 72, wherein

said master control unit enables realization of the target state of operation of said vehicle by said plurality of actuators and saving of energy consumed by the plurality of actuators.

74. (Added) The general drive control method according to claim 72 or 73, further comprising the step of

communicating between said master control unit and a plurality of individual control units individually managing each of said actuators.

75. (Added) The general drive control method according to any of claims 72 to 74, further comprising the step of

detecting, for each of said actuators, at least one of input energy input to each actuator and an output energy output from each actuator.

76. (Added) The general drive control method according to any of claims 53 to 75, wherein

said vehicle itself moves by the operation of at least part of said plurality of actuators.

77. (Added) The general drive control method according to any of claims 53 to 76, wherein

said actuators are at least two selected from an engine, a driving apparatus, a steering, a brake, an air conditioner and a light.

78. (Added) The general drive control method according to any of claims 53 to 77, wherein

said step of generally controlling drive of said plurality of actuators includes the step of controlling drive of said plurality of actuators by distributing among the plurality of actuators, available power or available work, which is the power or work that can be supplied by said energy source to the plurality of actuators as a whole, based on a safety variable related to safety of the vehicle, a comfort variable related to comfort enjoyed by the human being using the vehicle, and an economy variable related to economy of energy consumption by said plurality of actuators.